

The Database of Cost References by Groups – PDF#3

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COMMUNICATIONS

c1 – Composite Government Source

Costs – as follow:

Discussion – See the Source Below for Detailed Costs and Planning Factors for –
Line of Sight Microwave Systems

Tropospheric Scatter Systems

High Frequency Radio Systems

Satellite Communication Systems

Cable Systems

Fiber Optic Systems

Source – Defense Communications Agency Cost and Planning Factors Manual,
DCA, March 1983.

Recorded – May 2009.

c2 – Transmitter – 2-5 kW

Cost -- \$.15 million for investment

Discussion – unit costs, for ground terminals – low altitude systems

Source – RAND RM-2778-NASA, Com Sat: Support Info on the Cost Estimate
Given in Research Memo, RM-2709- NASA, June 30, 1961, p 11.

Recorded – February 4, 1964.

c3 – Two Underground Communication Networks – operations and maintenance

Cost -- \$440,000

Discussion – \$600 million for Air Force Titan ICBM program.

Work performed at Schilling AFB, Salina, Kan., and Warren AFB, Cheyenne,
Wy.

Sylvania Electric Products, Inc.

Source – Aviation Week, September 2, 1963, p 79.

Recorded – January 30, 1964.

c4 – ARC-1, Airborne Communications Equipment

Cost -- \$.4.1 times \$1,000

Discussion – Power output (w) = 8.0

Frequency (mc) = 156

Cumulative Average price for 100 units

Source – RAND RM 3072-PR, Procurement for Est. Elec. Equipment Costs, May
1963, p 17.

Recorded – February 5, 1964.

c5 – Leased Lines – Huntsville, Marshall – NASA

Cost -- \$660,000

Discussion – Von Braun – Total for NASA is \$2 million, for joining GSA can save about \$50,000, \$40,000, or \$35,000.

Mr. Buckley – We went over to the Telpac system, which gives a rate probably one quarter of the toll line rates. Then we went to the GSA with this rating. We are getting service for about one quarter the normal long distance rates.

Mr. Thomas – Your expenditure for this fiscal year was about \$2 million.

Source – House Approp Committee Hearing, 88th Congress, Part 3, p 261.

Recorded – October 29, 1963.

c6 – Lease Lines – NASA

Cost – as show below

Discussion – Headquarters, \$50,000

Langley Research Center, 14,000

Launch operations center, goes from \$76,000 to \$490,000

Lewis, \$167,000 to \$282,000

Manned Space Craft Center, jump up from \$375,000 to \$450,000.

Western Operations, \$104,000.

Source – House Approp. Committee, 89th Congress, Part 3, p 312.

Recorded – October 31, 1963.

c7 – Joint Tactical Communications Equipment

Cost – summary of a sample as follows

Discussion – PBG Calculated Costs – March 21, 1980

Equipment	Initial Buy	FY81\$	WSC
TTC-39 (600L)	68 K**		3.1090 M
TTC-39 (300L)	68 K**		2.5430 M
CNCE Type I(V)	49 K		3.5041 M
TRC-170 V1	24 K		2.1613 M

* Cost not adjusted for initial buy quantity.

** Quantities are total for all equipments of this program

Cost Elements in DTUPC include only contractor costs for Major Systems Equipment, System/Project Management, and System Test & Evaluation.

Source – Cost Data Handbook, Joint Tactical Communications Office, February 28, 1980.

Recorded – Updated May 27, 2009.

c8 – Project MALLARD – AN/TTC-30

Cost – as follows

Research & Development

R&D Contract \$3,800,000

Test Equipment \$720,000

Prototype (ET &ST Models)

Initial Spare Parts 32,000

Depot Spares Parts 38,000

Test Equip Spares 3,000

Total R&D	\$4,593,000
Production	
Contract (23 equipments)	\$11,800,000
Documentation*	1,100,000
Spare Parts:	
Initial Spare Parts	366,000
Depot Maint. Spares	877,000
Test Equip. Spares	73,000
Total Production	\$14,216,000

* Technical manual costs not included but are estimated to be \$200,000.
Source – Methodology for Systems Analysis of The Mallard Communications System, Final Report-April 1969. Ft. Monmouth, NJ.
Recorded – Updated May 27, 2009.

c29 – Tactical Communications Equipment

Cost – as follows

Discussion –

Equipment	Weapon System Unit Cost FY80\$ (millions) 1	Qty
TRC-170 (V1)	1.415	40
TRC-170 (V2)	1.040	177
TSQ-111 1(V)	3.048	44
TSQ-111 111(V)	1.848	73
TTC-42 150 LCS	.380	150
TTC-39 600 LCS	3.55	13
TTC-39 300 LCS	2.77	28
TTC-39 50 LMS	2.89	26

1 All costs from TRI_TAC Program Review, 9-10 July 1979.

Source – Operations Research Report No. 1-79, Tactical Communications Equipment Cost Estimating Factors, September 1979, OR Division, TRI -TAC, Fort Monmouth, NJ, p 3.
Recorded – Updated July 2009.

c9 – PRC-25, FM Tactical Radio – US Army

Cost -- \$2,400 procurement each

Discussion – Mr. Ignatius – PRC-25 is a man packed set and its range is about 5 miles. It can be increased by use of amplifiers to a greater range. The VRC-12 is larger more expensive vehicular set. It has a higher than 5 mile range. I am advised is about 20 miles.

920 channels

Reduction of 501 radio sets in the TO&E of the ROAD Infantry Division = a reduction of \$1,223,000.

Source – Senate Subc of Appropriations Committee Hearings, 88th Congress, 1st Session, HR7179, p 1050.

Recorded – November 13, 1963.

c10 – PRC-8-10. Communications Set

Cost -- \$400 procurement

Discussion -- the initial cost of those were \$1,100 and \$1,200.

Source – Senate Subc of Appropriations Committee Hearings, 88th Congress, 1st Session, HR7179, p 1050.

Recorded – November 12, 1963.

c11 – ARC-12 through ARC-62

ARC-12

Cost -- \$6,300, Cumulative average price for 100 units.

Discussion – Power Output (w) 6.0, Frequency (Mc) 400

ARC-27, Airborne Communications Equipment

Cost -- \$8,800, Cumulative average price for 100 units.

Discussion – Power Output (w) 10.0, Frequency (Mc) 400

ARC-33,

Cost -- \$8,800

Discussion – Power Output (w) 10.0

Frequency (Mc) 400

ARC-38,

Cost -- \$6,400, Cumulative average price for 100 units.

Discussion – Power Output (w) 100, Frequency (Mc) 25

ARC-39,

Cost -- \$900, Cumulative average price for 100 units.

Discussion – Power Output (w) 15, Frequency (Mc) 9

ARC-44,

Cost -- \$1,700, Cumulative average price for 100 units.

Discussion – Power Output (w) 8, Frequency (Mc) 42.

ARC-48,

Cost -- \$2,200, Cumulative average price for 100 units.

Discussion – Power Output (w) 2.0, Frequency (Mc) 243.

ARC-49,

Cost -- \$4,100, Cumulative average price for 100 units.

Discussion – Power Output (w) 8.0. Frequency (Mc) 156

ARC -52,

Cost -- \$13,900, Cumulative average price for 100 units

Discussion – Power Output (w) 20.0, Frequency (Mc) 400

ARC-58,
 Cost – \$18,100, Cumulative average price for 100 units.
 Discussion – Power Output (w) 400.0, Frequency (Mc) 30

ARC-60,
 Cost -- \$900, cumulative average price for 100 units
 Discussion – Power Output (w) .5
 Frequency (mc) 258

ARC-62,
 Cost -- \$18,100, cumulative average price for 100 units
 Discussion – Power Output (w) 30.0
 Frequency (Mc) 400
 Source – Procurement for Estimated Electronic Equipment Costs, RAND
 RM3072-PR, p 17.
 Recorded – February 5, 1964.

c12 – Medium Capacity Service Ground Terminal

Cost – as follows

Discussion –

Station Type	2	3	4	5
Major Equip. Quantity Assigned				
Antennas (60ft)	3	4	5	6
Receivers	3	4	5	6
Transmitters	3	4	5	6
Satellite Acq. Equipm.	1	1	1	1
Display & Alignm.	1	1	1	1
Timing & Orbit Data	1	1	1	1
Costs (\$millions)				
Investment	3.03	4.04	5.05	6.06
An. Oper.	0.76	1.14	1.39	1.64
Total Level Annual Costs	1.30	1.67	2.04	2.41

Source – Design & Use of an Early Communications Satellite System, RM-3514-
 NASA, July 63, p 95.
 Recorded – February 10, 1966.

c13 – SGLS, DoD's Space Ground Link System

Cost -- \$32 million for development and installation

Discussion –

Source – Missiles & Rockets, February 7, 1966, p 11.

Recorded – February 17, 1966.

c14 – Fixed Station Electronic Equipment, COMSAT

Cost – as follows

Discussion – Sylvania Electronic Products under a \$4.65 million award to build and install an 85 ft paraboloidal-reflector antenna and 100 ft bore-sight tower at the Brewster and Paumalu Terminals.

And ITT Fed. Labs under a \$1.78 million award for the principal ground transmitting, receiving, and tracking electronic subsystems.

Source – Missiles & Rockets, January 31, 1966, p 54.

Recorded – February 14, 1966.

c15 – Mobile Defense Communications Satellite Terminal, COMSAT

Cost -- \$7.2 million for 9 units

Discussion – Nine AN/TSC-54 mobile Army satellite communications Terminals will be built by Radiation, Inc., Melbourne, Fla., under a \$7.2 million contract from Army Electronic Command.

The terminal can be transported in a single C-130 aircraft and set up in less than 2 hrs., according to Radiation.

It is intended for use with the Initial Defense Communications Satellite Program.

Source – Aviation Week, November 15, 1965, p 118.

Recorded – December 20, 1965.

c16 – 489L Northern Area Communications System

Cost –

Discussion – Work on Air force 489L, the Northern Area Communications System now is complete. It is said to be the longest range and most powerful tropospheric scatter communications system in the Free World.

The FM system links Thule AFB in Greenland with the Hall Beach site in Northwestern Canada, a distance of about 587 miles. Philco was prime contractor for the system, which includes a 100,000 w transmitter and 4 parabolic antennas. Two at each site.

Source – Missiles and Rockets, November 29, 1965, p 11.

Recorded – December 27, 1965.

c17 – Military Communications System

Cost -- \$50 plus million

Discussion – to be operated by the military, including land stations, which are basically in existence.

This proposal was turned down by the DoD on the grounds that the \$50 plus million was about twice their cost to fly a suitable military communications system.

When challenged by COMSAT Corp. on the figure, the DoD admitted that the booster costs were not included on the theory that the Titan III was being

developed for other purposes and therefore would be available for use by the AF at no cost to fly DCA communications satellites.

While it is true, that the development of Titan III was paid for by the AF, the fabrication costs of the vehicles to fly the communications satellites should have been included in the military cost estimate for a communications network.

Source – Hearings Communications on Aeronautics & Sp. Sec, Senate, 89th Congress, 1st Session, January 26027, 1965, p 103.

Recorded – January 4, 1965.

C18 – Reference Repeaters

Cost – As follows in thousands of dollars.

Discussion –

Initial Invest.	LOS Rept.	LOS Rept.	LOS Rept.	TS Rept.	TS Rept.	TS Rept.	TS Rept	TS Rept	TS Rept/
Spacing St.Mil.									
	25	33	50	70	100	140	200	280	400
Enginer.	2.4	2.5	3.0	8.0	12.0	16.0	20.0	24.0	28.0
Facilit.	20.0	20.0	23.0	21.0	21.0	21.0	21.0	28.0	42.0
Trans. Equip.	31.2	33.7	44.7	75.8	87.8	108.8	147.1	219.1	478.6
Support Equip.	3.8	3.8	3.8	7.0	7.0	7.5	7.5	11.5	15.0
Inst. & Check.	2.5	2.5	2.7	5.0	5.0	5.0	6.0	14.0	16.0
Init. Stock	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.0
Total I.I.	59.6	62.2	77.3	116.9	130.8	156.3	201.7	296.8	572.6
Annual M & O									
Material	1.0	1.0	1.0	3.0	3.0	3.0	4.0	8.0	12.0
Labor	3.0	3.0	3.0	6.0	6.0	6.0	6.0	8.0	10.0
Stocks	1.5	1.5	1.5	2.0	2.0	2.0	2.0	4.0	26.5
Total	5.5	5.5	5.5	11.0	11.0	11.0	12.0	20.0	48.5

Source – Design & Use of An Early Communications Satellite System, RAND RM-3514 – NASA, July 1963, p 106.

Recorded – February 10, 1966.

C19 – Ground Station on St. Croix in the Virgin Islands

Cost -- \$6 million

Discussion – COMSAT asked FCC authority to construct.

Source – Aviation Week, May 2, 1966, p 26.

Recorded – May 26, 1966.

c20 – Communications Satellite Ground Station

Cost -- \$2 million

Discussion – just completed at Caddo Gap, Arkansas

Will enable Hughes scientists to begin long range experiments on space communications completely independent of commercial requirements.

Built and operated with company funds.

85 ft. dish antenna capable of maintaining contact with satellites over both the Atlantic and Pacific Oceans.

Source – Missiles & Rockets, April 18, 1966, p 1.

Recorded – May 3, 1966.

c21 – Ground Receiving Stations for ESSA 2

Cost – from \$1,000 to \$30,000

Discussion – approximately 100 have been established

Have average picture-receiving ranges of about 2,100 miles.

And most are receiving signals from the satellite during 3 consecutive orbits.

This enables the station to receive cloud cover information over an area of approximately 12 million square miles.

Source – Aviation Week, March 21, 1966

Recorded – April 8, 1966.

c22 – Ground Station for COMSAT Corp.

Cost -- \$5 million to build

Discussion – in the district of Chairman Harley O. Staggers (D-W.Va)

Of the house Commerce Committee, which has jurisdiction over telecommunications policy and oversees Fed. Comm. Communications, which rules on ground station applications. The Moorefield, W, Va station will be the East Coast counterpart to the one at Brewster Flat, Wash, home state of Chairman Warren G. Magnuson of the Senate Commerce Committee.

Source – Aviation Week, April 4, 1966, p 25.

Recorded – April 14, 1966.

c23 – 97 ft. Antenna for COMSAT

Cost –

Discussion – Philco-Ford's WDL Div. is building the 4 super-antenna systems for COMSAT under a \$6.6 million contract. The systems will be completed at a rate of 1 each month beginning in September with the West Virginia station.

Philco design calls for an azimuth elevation antenna mounting configuration on a solid concrete pedestal.

Source – Aerospace Technology, March 11, 1966, p 40.

Recorded – April 19, 1968.

c24 – UHF Ground Terminals

Cost – \$7 million

Discussion – ranging from a 1 man receive only alert receiver to full duplex systems for jeeps, ship, and aircraft.

Collins radio Co.

Will deliver 45 terminals under terms of the \$7 million contract from the AF Electronics Systems Division. Initial tests are planned with the Lincoln Exp. Sat, LES-6 probably late this year, and next year with Hughes tactical communications satellite.

For the TACOMSAT tests, Radio Corp is building 18 SHF terminals under a \$3.4 million contract from Army Satellite Communications Agency.

Source – Aerospace Technology, March 11, 1968, p 41.

Recorded – April 19, 1968.

C25 – Ground Terminals for COMSAT

Cost -- \$6 million

Discussion – one at Brewster Flat, Washington

One on the island of Oahu in Hawaii.

Two 85 ft dia. parabolic antennas are planned for each of the new stations.

If med. alt. rather than synchronous system, the company plans to add a third antenna at each site.

Long lead time items are the 85 ft antennas – will be ready by fall of 1966.

(facilities alone, \$1.2 million for each station) from Aetron.

Source – Aviation Week, July 26, 1965, p 65.

Recorded – August 31, 1965.

C26 – Compact COMSAT Ground Station

Cost -- \$300,000 per unit.

Discussion – Small air-transportable communication satellite ground terminal that weighs only 4,000 lbs including antenna has been developed by Sylvania Electronic Systems for tactical applications.

Undergoing tests with Syncom 3 which is over the mid Pacific

Built into a standard S-141 type mobile shelter, the terminal uses a 12 ft dia.

Antenna dish which can be disassembled for transport.

Present configuration – 1 duplex voice channel and 16 simultaneous teletypewriter channels.

Use a 5 kw air cooled tube by Varian Association.

Source – Aviation Week, November 15, 1965, p 125.

Recorded – December 20, 1965.

C27 – Communications Satellite Ground Terminal

Cost -- \$2.9 million contract to build

Discussion – British Marconi Company

Near Nairobi in Kenya, Africa.

The terminal, the ninth sold by Marconi, will have a 97 ft dia. Antenna.\

Source – Aviation Week, October 21, 1968, p 91.

Recorded – December 31, 1968.

c28 – Ground Terminals to work with the global space segment.

Cost – a terminal is estimated at \$3-6 million.

Discussion – of the 68 nation International Telecommunications Consortium (Intelsat) include Ceylon, Finland, Israel, the Ivory Coast, Maldives Isls, Mauritius, and Senegal.

Source – Aviation Week, April 7, 1969, p 13.

Recorded – June 6, 1969.